

Title (en)  
SEMICONDUCTOR DEVICE

Title (de)  
HALBLEITERVORRICHTUNG

Title (fr)  
DISPOSITIF SEMI-CONDUCTEUR

Publication  
**EP 2519972 A1 20121107 (EN)**

Application  
**EP 10840858 A 20101202**

Priority  
• JP 2009297140 A 20091228  
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Abstract (en)  
[origin: US2011156025A1] It is an object to provide a memory device whose power consumption can be suppressed and a semiconductor device including the memory device. As a switching element for holding electric charge accumulated in a transistor which functions as a memory element, a transistor including an oxide semiconductor film as an active layer is provided for each memory cell in the memory device. The transistor which is used as a memory element has a first gate electrode, a second gate electrode, a semiconductor film located between the first gate electrode and the second gate electrode, a first insulating film located between the first gate electrode and the semiconductor film, a second insulating film located between the second gate electrode and the semiconductor film, and a source electrode and a drain electrode in contact with the semiconductor film.

IPC 8 full level  
**H01L 27/115** (2006.01); **G11C 16/04** (2006.01); **H01L 27/12** (2006.01); **H01L 27/13** (2006.01)

CPC (source: CN EP KR US)  
**G11C 16/0433** (2013.01 - KR); **H01L 27/1225** (2013.01 - EP KR US); **H01L 27/124** (2013.01 - US); **H01L 27/1251** (2013.01 - US); **H01L 27/1255** (2013.01 - US); **H01L 27/13** (2013.01 - EP KR US); **H01L 29/78648** (2013.01 - US); **H01L 29/7869** (2013.01 - CN US); **H10B 41/70** (2023.02 - EP KR US); **H10B 43/30** (2023.02 - KR); **H10B 69/00** (2023.02 - CN EP KR US); **H10B 99/00** (2023.02 - US); **G11C 16/0433** (2013.01 - EP US); **Y02D 10/00** (2018.01 - EP)

Designated contracting state (EPC)  
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**US 2011156025 A1 20110630; US 9472559 B2 20161018**; CN 102656691 A 20120905; CN 102656691 B 20150729; CN 105047669 A 20151111; CN 105047669 B 20180814; EP 2519972 A1 20121107; EP 2519972 A4 20131225; EP 2519972 B1 20190612; IN 5057DEN2012 A 20151009; JP 2011155255 A 20110811; JP 2013016840 A 20130124; JP 2013128129 A 20130627; JP 2014187408 A 20141002; JP 2015135976 A 20150727; JP 2015156515 A 20150827; JP 2017085172 A 20170518; JP 2018088533 A 20180607; JP 2019050421 A 20190328; JP 2020123753 A 20200813; JP 2022024155 A 20220208; JP 2024015031 A 20240201; JP 5190555 B2 20130424; JP 5376737 B2 20131225; JP 5580190 B2 20140827; JP 5706565 B2 20150422; JP 5933777 B2 20160615; JP 6086938 B2 20170301; JP 6275892 B2 20180207; JP 6449492 B2 20190109; JP 6705883 B2 20200603; JP 6987176 B2 20211222; KR 101772150 B1 20170828; KR 101894400 B1 20180904; KR 102006729 B1 20190802; KR 102063214 B1 20200107; KR 102198144 B1 20210104; KR 102356530 B1 20220208; KR 102480794 B1 20221222; KR 20120091467 A 20120817; KR 20170098336 A 20170829; KR 20180097796 A 20180831; KR 20190090892 A 20190802; KR 20200000503 A 20200102; KR 20210000760 A 20210105; KR 20220016292 A 20220208; KR 20230003424 A 20230105; TW 201140753 A 20111116; TW 201616613 A 20160501; TW I557848 B 20161111; TW I608570 B 20171211; US 10797054 B2 20201006; US 11424246 B2 20220823; US 2017033110 A1 20170202; US 2021167067 A1 20210603; US 2022415893 A1 20221229; WO 2011081000 A1 20110707

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**US 97634010 A 20101222**; CN 201080059846 A 20101202; CN 201510354385 A 20101202; EP 10840858 A 20101202; IN 5057DEN2012 A 20120607; JP 2010072068 W 20101202; JP 2010289073 A 20101227; JP 2012196754 A 20120907; JP 2013012883 A 20130128; JP 2014141874 A 20140710; JP 2015034097 A 20150224; JP 2015100896 A 20150518; JP 2017015609 A 20170131; JP 2018001718 A 20180110; JP 2018227875 A 20181205; JP 2020084961 A 20200514; JP 2021194192 A 20211130; JP 2023198717 A 20231123; KR 20127019609 A 20101202; KR 20177023305 A 20101202; KR 20187024485 A 20101202; KR 20197022080 A 20101202; KR 20197038570 A 20101202; KR 20207037644 A 20101202; KR 20227002333 A 20101202; KR 20227044707 A 20101202; TW 105101854 A 20101224; TW 99145814 A 20101224; US 201615292362 A 20161013; US 202017061920 A 20201002; US 202217891248 A 20220819